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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/823,729      | 04/14/2004  | Takashi Watanabe     | 042341              | 5344             |
| 38834           | 7590        | 01/30/2006           |                     | EXAMINER         |
|                 |             |                      |                     | VU, DAVID        |
|                 |             |                      | ART UNIT            | PAPER NUMBER     |
|                 |             |                      |                     | 2818             |

DATE MAILED: 01/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

*All*

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/823,729             | WATANABE ET AL.     |  |
|                              | Examiner<br>DAVID VU   | Art Unit<br>2818    |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 06 December 2005.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-33 is/are pending in the application.  
 4a) Of the above claim(s) 5-11, 14-27 and 30-33 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-4, 12, 13, 28 and 29 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) 1-33 are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 14 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 12, 13, 28 and 29 are rejected under 35 U. S. C. 102(b) as being anticipated by Tan et al. (US Pat. 6,001,706, herein after Tan).

Regarding claims 1-4 and 28-29, Tan discloses a semiconductor device fabrication method comprising the steps of: polishing the surface of a film-to-be-polished 18 formed over a semiconductor substrate 10 by polishing slurry/CMP process (fig. 10A and col. 5, lines 53-62); and after the surface of the film-to-be-polished 18 has been planarized, further polishing the surface of the film-to-be-polished 18 by polishing slurry/CMP process one more time (fig. 10B). Note that the CMP method is characterized by polishing a wafer surface with an abrasive cloth (pad) while supplying a polishing solution (slurry) mixed with abrasive grains. {See **Koutny, Jr et al.** (US 6,171,180) (col. 1, line 60 through col. 2, line 17 or **Hsu et al.** (US 6,677,239) (col. 1, lines 40-49; col. 10, lines 18-24 and **Wang** (US 6,046,112) (col. 6, lines 13-17)}.

Regarding claims 12 and 13, Tan discloses that before the step of planarizing the surface of the film-to-be-polished, the steps of: forming over the semiconductor substrate 10 an

insulation film (hard mask Si<sub>3</sub>N<sub>4</sub> 14) having polish characteristics different from those of the film-to-be-polished (oxide 18); forming an opening in the insulation film 14; etching the semiconductor substrate 10 with the insulation film 14 as a mask to form a trench in the semiconductor substrate 10 (figs. 7 and 8A); and forming the film-to-be-polished 18 in the trench and over the insulation film 14 (fig. 9A), in the step of further polishing the surface of the film-to-be-polished , the surface of the film-to-be-polished 18 is polished with the insulation film 14 as a stopper (fig. 10A).

## Response to Arguments

2. Applicant's arguments filed 12/06/05 have been fully considered but they are not persuasive.

Applicant argues that the prior art (Tan) does not teach polishing the surface of the film-to-be-polished with the polishing pad while the polishing slurry and water are being supplied onto the polishing pad. Tan discloses the steps of polishing layer 18 by polishing slurry/CMP process (fig. 10A and col. 5, lines 53-62); and after the layer 18 has been planarized, further polishing the surface of the layer 18 by polishing slurry/CMP process one more time (fig. 10B). Note that conventional CMP process is a method of simultaneous pad and substrate rotations with pressure applied between the polishing pad and substrate in the presence of the CMP slurry composition (comprising ZrO<sub>2</sub> particles, for example) and a surfactant, such as TMAH or TBAH in a water solution. Therefore, Tan, as indicated in the above rejection, clearly discloses claimed features {See Wang (US 6,046,112) (col. 6, lines 13-17)}.

***Conclusion***

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DAVID VU  
PRIMARY EXAMINER